

What is claimed is:

1. A laser device for use in coupling a laser energy into an output device, comprising:

a laser source disposed on a substrate, the laser source producing the laser energy;

a photodiode disposed on substrate; and

an optical isolator disposed between the laser source and the output device, the optical isolator having a front face aligned to partially reflect the laser energy from the laser source onto the photodiode.

2. The laser device of claim 1, further comprising a submount mounted to the substrate, wherein the photodiode and the laser source are mounted to the submount.

3. The laser device of claim 1, further comprising a first lens disposed between the laser source and the optical isolator, the first lens positioned to couple the laser energy to the output device and positioned to couple the partially reflected laser energy to the photodiode.

4. The laser device of claim 3, wherein the laser source and the first lens are aligned on a first optical axis and wherein the optical isolator defines a second optical axis that forms an acute angle with the first optical axis.

5. The laser device of claim 4, wherein the acute angle is between 0 and 15 degrees.

6. The laser device of claim 4, wherein the optical isolator has a back face parallel to the front face.

7. The laser device of claim 1, further comprising:

a first lens disposed to couple the laser energy into the optical isolator as a collimated beam and disposed to couple the partially reflected laser energy to the photodiode; and

a second lens disposed to receive the collimated beam and couple the collimated beam to the output device.

8. The laser device of claim 1, wherein the photodiode is laterally displaced from the laser source.

9. A method of tapping a portion of a laser energy from a laser device having a laser source and an output device, the method comprising:

disposing a lens between the laser source and the output device to couple the laser energy from the laser source into the output device;

disposing an optical isolator between the lens and the output device;

disposing the optical isolator in a tilted configuration to reflect the portion of the laser energy through the lens and onto a desired location laterally displaced from the laser source.

10. The method of claim 9, further comprising disposing a photodiode at the desired location to detect the portion of the laser energy.

11. The method of claim 9, wherein the optical isolator is disposed such that a front face of the optical isolator forms an acute angle with an axis defined by the laser source.

12. The method of claim 9, wherein the optical isolator has a back face parallel to the front face.

13. The method of claim 9, further comprising disposing a second lens between the optical isolator and the output device, wherein the first lens and the second lens form a collimating lens pair.

14. A transponder comprising:
a receiver stage;
a controller; and
a transmitter stage, the controller being coupled to the receiver stage and the transmitter stage for receiving and transmitting data, the transmitter stage comprising:
a laser source for producing a laser energy;
an optical objective positioned between the laser source and an output device to couple the laser energy from the laser source to the output device; and
an optical isolator positioned to reflect a portion of the laser energy through the optical objective and onto a location laterally displaced from the laser source.

15. The transponder of claim 14, wherein the transmitter stage further comprises a photodiode positioned adjacent the location laterally displaced from the laser source.

16. The transponder of claim 15, wherein the laser source and the photodiode are formed on a submount.

17. The transponder of claim 14, wherein the optical isolator is tilted relative to an optical axis defined by the laser source.

18. The transponder of claim 14, wherein the optical objective comprises a first lens and a second lens, wherein the optical isolator is positioned between the first lens and the second lens.

19. The transponder of claim 14, wherein the optical objective comprises a lens positioned to couple the laser energy to the output device and positioned to couple the partially reflected laser energy to the location laterally displaced from the laser source.

20. The transponder of claim 14, wherein the receiver stage comprises:

- a photodiode;
- a trans-impedance amplifier; and
- a boosting amplifier.

21. The transponder of claim 14, wherein the transmitter stage further comprises:

- a modulator; and
- an optical amplifier coupled to receive the laser energy.